

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 January 2003 (30.01.2003)

PCT

(10) International Publication Number
WO 03/008931 A2

(51) International Patent Classification⁷: **G01N**

(21) International Application Number: PCT/US02/22689

(22) International Filing Date: 17 July 2002 (17.07.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/306,296 17 July 2001 (17.07.2001) US

(71) Applicants and

(72) Inventors: **HVICHIA, Georgi** [US/US]; 10640 Lockart Road, Philadelphia, PA 19116 (US). **GASPARINI, Paolo** [IT/IT]; Via Castel Gonnelle, I-25030 Brandico (IT).

(74) Agents: **COLBY, Gary, D.** et al.; Akin, Gump, Strauss, Hauer & Feld, L.L.P., One Commerce Square, Suite 2200, 2005 Market Street, Philadelphia, PA 19103-7086 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MICROSTRUCTURE FOR PARTICLE AND CELL SEPARATION, IDENTIFICATION, SORTING, AND MANIPULATION

(57) Abstract: The invention relates to microscale cell separating apparatus which are able to separate cells on the basis of the size of the cells, interaction of the cells with surfaces of the apparatus, or both. The apparatus comprises a stepped or sloped separation element interposed between an inlet region and an outlet region of a void that can be filled with fluid. The void can be enclosed within a cover, and fluid flow through the void engages cells with the separation element. Only cells which have (or can deform to have) a characteristic dimension smaller than or equal to the distance between a step and the cover or body can pass onto or past a step. Modification of surfaces within the apparatus can also inhibit passage of cells onto or past the step.



WO 03/008931 A2